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# First photographic record of albinism in hog deer (*Axis porcinus*) from Bardia National Park, Nepal

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## ABSTRACT

Hog Deer or Laguna (*Axis porcinus*) is one of the important cervids in Bardia National Park (BNP) of Nepal. They are easily observed roaming around tall grassland nearby river floodplains. However, albino hog deer are barely found in the park. This study presents the first photographic report of albino hog deer in the core area of BNP while the author was conducting camera trapping for tiger monitoring. Albinism is associated with melanin and rare mutation. These findings reinforce mounting evidence of the value of observations of albino hog deer made as by-catch from sighting focused on further study in detail, especially in the context of extending information on poorly known albinism in hog deer.

**Keywords:** Hog deer, Bardia National Park, NTNC, Albinism, Melanin

## 1. INTRODUCTION

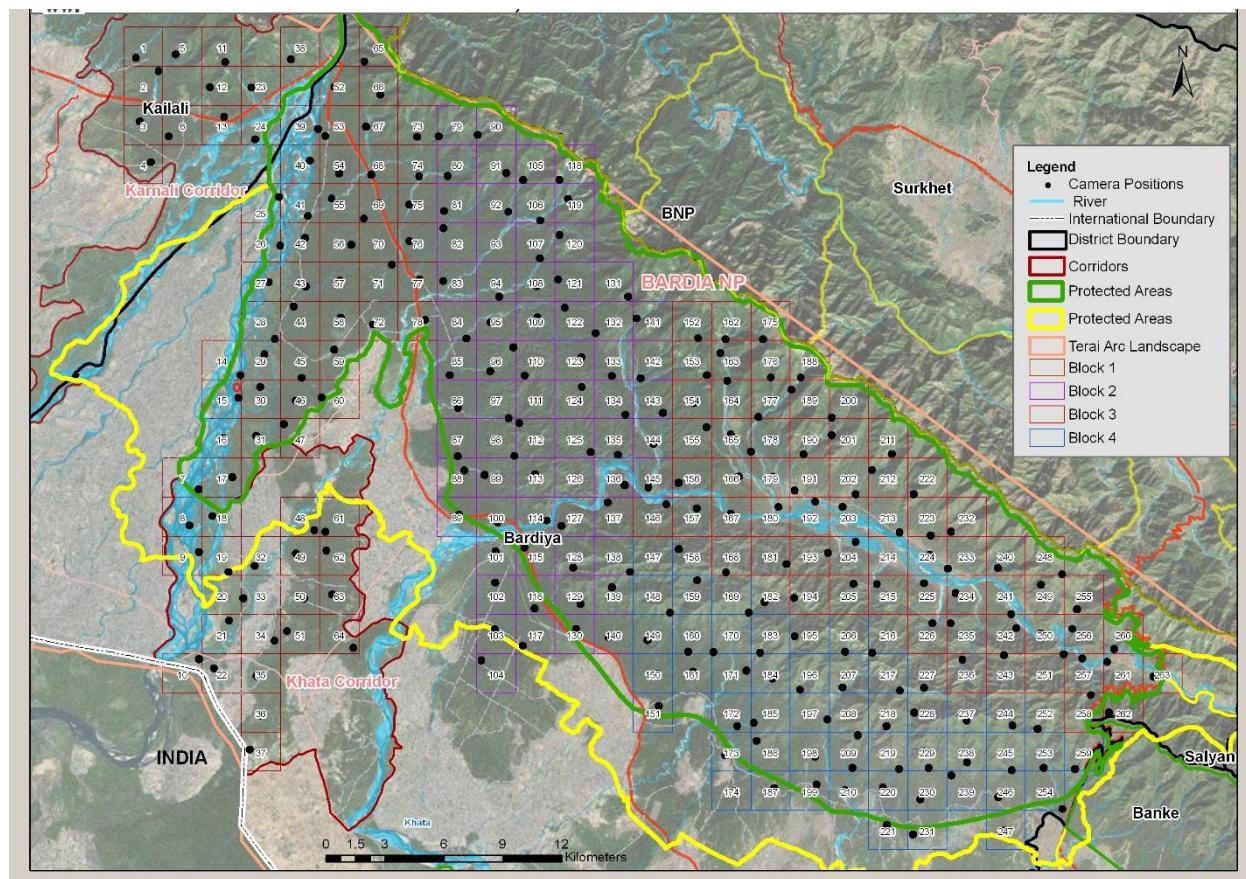
Hog deer or Laguna (*Axis porcinus*) fall under the category (Kingdom: Animalia, Phylum: Chordata, Order: Artiodactyla, Class: Mammalia, Family: Cervidae) and is a small deer commonly found in India, Nepal, Pakistan, Bangladesh to the mainland of Southeast Asia. However, it also occurs in Thailand, China, Myanmar, Laos and Vietnam. It has been also introduced to Australia and the United States of America (Bentley, 1998). Hog deer has been classified into two sub-species *A. p. porcinus* of Nepal, India, Sri Lanka, and Burma (Smaller) and *A. p. annamiticus* of Southern Thailand and Vietnam (Whitehead, 1972). Hog deer has been listed as Endangered species in Thailand (Miller, 1975), Vietnam and Bangladesh (Seidensticker and Hai, 1983). Hog deer is one of the important prey species of the endangered Bengal Tiger, *Panthera tigris* (Stoen and Wegge, 1996).

The hog deer was the second important species, contributing 9.3% of the total biomass in BNP (Wegge et al., 2018). Hog deer encounter rate and detection probabilities were 1.02 and 0.34, respectively, with a density estimate of 16.5 individuals /km<sup>2</sup> in BNP (Yadav, 2014). And it is important cervids in Bardia National Park (BNP) of Nepal. Hog deer are ubiquitous in the tall grassland habitat of the Terai and are observed roaming around the riverbanks of the Babai, Karnali, Koshi, Narayani and Rapti rivers (Dhungel and O'Gara, 1991). Grassland

having *Saccharum spontaneum* is an important diet of hog deer (Dhungel and O'Gara, 1991). A study made by Odden et al., (2005) about the habitat use of Hog deer based on density estimates at BNP, showed that they captured 39 hog deer using long nets, out of which eighteen of them were radio-tracked until the grass-cutting period in January 2000. They found out that the density of hog deer was 77.3 and 5.8 per km<sup>2</sup> in the floodplain and riverine associations, respectively. Tamang's (1979) study of the Bengal Tiger assumed that free-ranging tigers require 7kg of meat daily for this tiger would need to kill 111 hog deer per year (based on assumption that only 70% is considered edible).

## 2. METHODOLOGY

Bardia National Park (BNP) is one of the protected areas of Nepal established in 1988 AD. BNP is one of the largest National Parks that is situated in southwestern, the lowland of terai having an area of 968 km<sup>2</sup>. Geographically, it is situated between 28°47' or 28°28' 12" N latitude and 81°47' or 81° 28' 12" E Longitude, with an elevation of 152-1218m above sea level (a.s.l), whereas its buffer zone covers an additional area of 507 km<sup>2</sup> which covers three districts (Banke, Surkhet and Bardia). BNP is bordered by Shiva Khola in the East, Kohalpur-Surket Road in the West, Churai range in the North and East-west Highway, Buffer zone forest and Rapti river in the South.



**Figure 1** Map of Bardia National Park, Nepal, showing locations of camera traps (black dots) and record of albino hog deer (red circle) in 15 grid cells.

The park is very rich in biodiversity resulting in 839 species of flora and 62 species of mammals including 10 endangered animals like the Asian Elephant (*Elephas maximus*), Bengal Tiger (*Tigris tigris*), One-horned Rhinoceros (*Rhinoceros unicornis*), Swamp Deer (*Cervus duvauceli duvauceli*), etc., 513 birds including 6 protected like Giant Hornbill (*Buceros bicornis*), Black Stork (*Ciconia nigra*), Sarus Crane (*Grus antigone*), etc. 25 species of reptiles including 3 protected like Gharial crocodile (*Gavialis gangeticus*), Golden monitor lizard (*Varanus flavescens*) and Burmese python (*Python molurus*) and 121 species of fish (BNP, 2022). Dinerstein, (1979) divided BNP into seven main vegetation types sal forest (*Shorea robusta*), khair-Sissoo forest, Riverine Forest, Hardwood Forest and three grasslands. *Shorea robusta*, *Dalbergia sissoo*, *Terminalia spps*, *Trewia nudiflora*, *Acacia catechu*, *Mallotus philippinensis*, etc., are major dominant tree species and mainly *Saccharum spontaneum* and *S. bengalensis* are the dominant grass species of the park.

The park lies in a sub-tropical climatic zone with three distinct seasons, a monsoon season (November to mid-February), a dry season (December to January) and a hot season (mid-February to June) reaching a maximum temperature of 41°C (Dinerstein, 1979).

### 3. DISCUSSION

Albinism is an inherited condition that is caused by partial or complete loss of pigmentation in the Skin, hair, eyes and white hair due to a lack of tyrosinase enzyme (Melanin) (Hayashi and Suzuki, 2018). Albinism is generally caused by several different genes (Summers, 2009). On the contrary, Melanism is the opposite of albinism, caused by the excessive production of melanin pigment. Albinism is a rare mutation that out of 10,000 births, there is a frequency of only one true albino (Binkley, 2001). Albinism has been observed in every animal like mice, rabbits and guinea pigs. Wild animal having albino are more visually spotted and lacks the camouflaging pattern within the same species. Thus, albinism may be a great disadvantage for hunting and locating mates and are rejected for their abnormal coloration (Acevedo et al., 2009). Animal having albinism is prone to cancer due to a lack of melanin (Halls, 2010) and has poor eyesight which affects their vision for searching their prey and their food (Miller, 2005).

A rare sighting of an albino hog deer (*Axis porcinus*) was observed at 28.474878° N and 81.252052° E on December 22, 2022, in the grassland of the BNP nearby Bagh Machan at grid ID 15 (Figure 1). There are many Machans made nearby rivers to observe the activity of different animals. While doing tiger monitoring by camera trapping in the BNP by members of NTNC, the author observed albino hog deer coming out with siblings to drink water nearby the river. The albino animal was seen with two other hog deer, a male hog deer and another unrecognizable hog deer that might be female (Figure 2). No other animals or herds were seen during the observation time. No presence of other animals or hog deer was noticed for about 500m distance. Albinism has been observed in animals in Nepal and in different parts of India. Pathak et al., (2023) have recorded albinism in the chital (*Axis axis*) from Chitwan National Park, Nepal. Pande et al., (2010), Sayyed et al., (2015) and Patel, (2020) has recorded albinism in chital from different part of India. To the author's knowledge, this is the first photographic evidence of albinism in hog deer from Bardia National Park, Nepal.



**Figure 2** An albino hog deer with its sibling coming out to drink water nearby the river in Bardia National Park, Bardia, Nepal.  
Photo: © Shailendra Kumar Yadav

## 4. CONCLUSION

In conclusion, this is the first case of albinism found in the hog deer (*Axis porcinus*) in Bardia National Park, Nepal. Albinism is a rare disorder that is impossible to cure and can be life-threatening to the animal having this disorder. Most albino animals are demanded because of their color and as a result, their species are declining. Thus, Proper care and treatment of albino animals are necessary if it is kept in captivity. A further ecological study of albinism is recommended from this evidence in BNP.

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### Informed consent

Not applicable

### Ethical approval

Hog deer (*Axis porcinus*) from Bardia National Park, Nepal was observed in the study. The Animal ethical guidelines are followed in the study for species observation and identification.

### Conflicts of interests

The authors declare that there are no conflicts of interests.

### Funding

The study has not received any external funding.

### Data and materials availability

All data associated with this study are present in the paper.

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